Medical and Pediatric Oncology 29:589–592 (1997)

MISLEADING LEADS

The following paper by Frappaz et al. is the first of a series of occasional notes that will illustrate diagnostic pitfalls that can be encountered in reaching a correct diagnosis.

We believe these brief reports should prove helpful to clinicians who must confront similar problems in their daily practices.

Authors wishing to submit an article of this kind should indicate in the letter of submission that the paper is meant for the ''Misleading Leads'' series. Such papers should be brief and to the point, not exceeding six double-spaced typewritten pages in length, including references and tables, and containing not more than four figures.

False Positive MIBG Scan

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The fortuitous discovery of a left posterior cervico-mediastinal mass during hospitalization for hemolytic anemia in an 18 month old baby is reported. Metaiodobenzylguanidine (MIBG) uptake suggested a sympathetic tissue origin of the mass despite negative catecholamines excretion, but histopathologic examination revealed a juvenile capillary angioma within a normal sympathic ganglion. Med. Pediatr. Oncol. 29:589–592, 1997.

Key words: neuroblastoma; false positive; MIBG scan

INTRODUCTION

Radio-iodinated metaiodobenzylguanidine (*I-mIBG) has particular affinity for chromaffin tissue. Any chromaffin lesion can demonstrate uptake. This compound has thus been widely used to detect pheochromocytomas, neuroblastomas, and carcinoid tumors. The sensitivity is 88% and the specificity exceeds 99%. Anecdotal reports of false positive cases defined as MIBG uptake in non-chromaffin tissue have been published [1–5], and the authors wish to add an unusual case of this kind.

CASE REPORT

Federico D. was 18 months old when, in the process of work-up for hemolytic anemia, a routine X-ray film detected a mass in the upper mediastinum on the left. Additional studies included a CT scan that showed a non-calcified mass in the left thoracic inlet that enhanced after contrast injection. This costovertebral mass reached but did not invade the intervertebral foramen of T1, T2, and T3, infiltrated the intercostal space of T1 to T3 and was in contact with the left subclavicular vessels. An extension toward the cervical region could be seen (Fig. 1). Since neuroblastoma was included in the differential diagnosis, an MIBG scan was also performed with the results shown in Fig. 2. This mass corresponded to that seen on the CT scan. No uptake was detected elsewhere. Urinary catecholamines were negative. A vascular lesion remained in the differential diagnosis, so that a conventional angiogram of the thoracic aorta was performed. It

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Received 27 February 1997; Accepted 9 April 1997

Fig. 1. Contrast-enhanced thoracic CT-scan: an infiltrative, contrast-enhanced, solid mass is located in the left posterior mediastinum (black arrows).

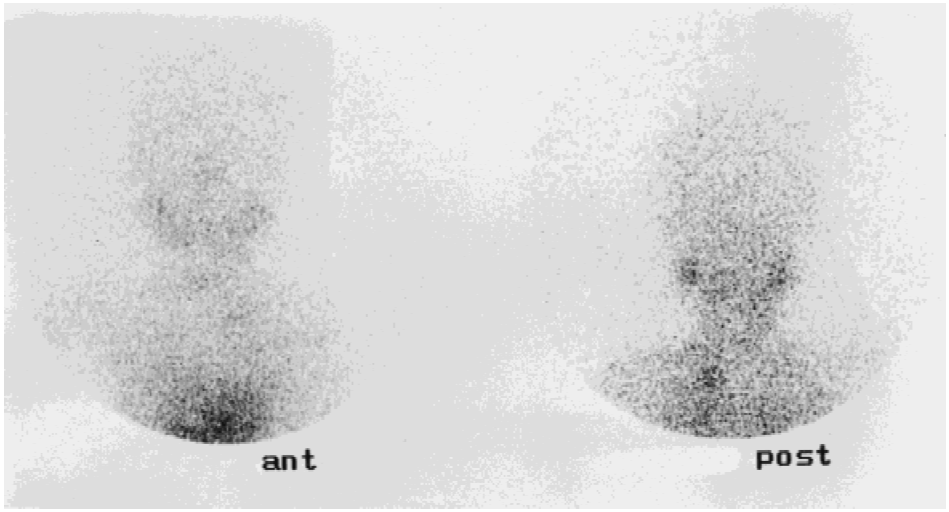

Fig. 2. Anterior and posterior views of thorax and neck showing elective uptake of 131 I-mIBG in the upper part of left thorax.

showed (Fig. 3) a dilated left thyrocervical trunk without any early venous drainage and a dense and homogeneous tumor ''stain'' in the capillary phase. This homogeneous hypervascularisation was not typical for a neuroblastoma, and an angiomatous lesion therefore continued in the differential diagnosis.

Fine needle biopsies were obtained in five different tumor sites. Only normal blood cells were detected on frozen section, and the scheduled Tru-cut biopsy was thus canceled, since the possibility of neuroblastoma became weaker. Phrenic nerve and Claude Bernard Horner palsies were considered to be the major risks of definitive surgical dissection and excision. A limited diagnostic thoracotomy was therefore advised by the consulting radiologist and surgeon. At surgery, the tumor was grossly consistent with a widely infiltrating ganglioneuroblastoma, but according to plan, only the thoracic part of the lesion, which was not particularly hemorrhagic, was resected.

Macroscopically, the removed mass measured 40 × 35 × 12 mm. It was partially translucent and partially hemorrhagic. Microscopically (Fig. 4) it was a juvenile or infantile capillary hemangioma. Focally the vascular component was admixed with nerves and ganglion cells that exhibited the organized pattern of a sympathic ganglion. Thus, the diagnosis was that of a juvenile capillary hemangioma infiltrating nerves and sympathic ganglia rather than that of a complex hamartoma. No feature

Fig. 3. Selective Angiography performed before the surgical biopsy shows a highly vascularized mass from the thyrocervico-scapular trunk. No early venous wash-out is depicted.

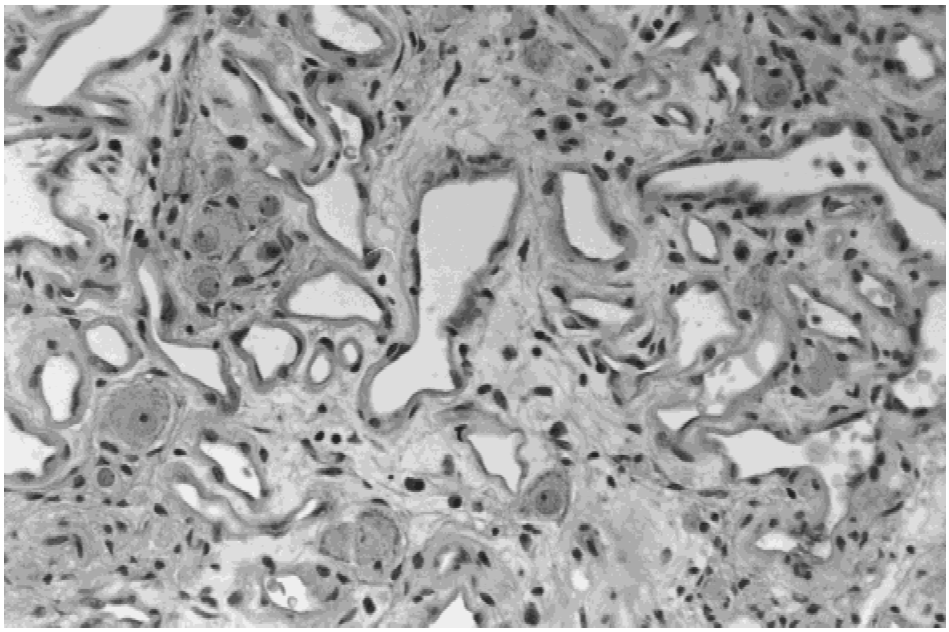

Fig. 4. Normal ganglion cells surrounded by angiomatous tissue.

either of true ganglioneuroma or of neuroblastoma was identified.

The postoperative CT scan showed the residual cervical mass, which failed to take up MIBG on re-examination.

DISCUSSION

The high specificity of MIBG uptake has been stressed by Leung et al. and is usually considered virtually pathognomonic for such neuroendocrine tumors as

pheochromocytomas, neuroblastomas, carcinoids, nonsecreting paragangliomas, sporadic, or familial medullary carcinomas of the thyroid and chemodectomas [1,4,5]. However rare reports show that non-neuroendocrine masses may show MIBG uptake: infantile myofibromatosis [1,3] adenomatous polyp [7], small ischemic kidney, large cavernous hemangioma [2], atypical schwannoma [4], zona fasciculata adrenal adenoma, and adrenal metastasis of choriocarcinoma [4] have been described. The two last examples suggest that sympathic tissue may be infiltrated by neoplastiac tissue and become visible as in our case. Abnormal blood flow within a hamartoma may also be responsible for the accumulation of MIBG within the mass, and was responsible for the findings in our patient as well as in the large cavernous hemangioma described by Horne et al. [2]. Other pitfalls have been described [6]. For example, there may be difficulties related to the site: posterior costovertebral lesions and sternal metastases may be difficult to distinguish from the heart, which normally takes up MIBG. The findings in our patient were easily differentiated from a physiological uptake, however. Concordance with the CT scan findings strongly suggested an anomalous MIBG uptake.

Juvenile capillary angioma is a benign condition that may spontaneously regress [8]. Neural involvement is a well-known phenomenon in juvenile capillary hemangioma, but sympathetic nerve infiltration has not been reported to our knowledge [9].

Extensive surgery in the cervicothoracic region entails the risk of neurologic complications especially the Claude Bernard Horner syndrome and phrenic nerve palsy. Our case is instructive in that a positive MIBG scan should not be considered diagnostic of neuroblastoma or ganglioneuroblastoma. Biopsy confirmation is advisable, even by fine needle aspiration. It may be sufficient as in our patient, to obtain tissue for cytology, immunology, and other studies.

CONCLUSION

A rare case of a cervico-thoracic juvenile capillary angioma with MIBG uptake is reported to alert clinicians. They are advised to obtain biopsy confirmation of MIBG positive masses, which thereby are presumed to be neuro-endocrine in nature. Further reporting of such false positive MIBG scans are warranted.

ACKNOWLEDGMENT

We thank S. Soulie for typing this manuscript.

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